REPORT TITLE: "Develop Data Management System for Assistance in Conducting Area of Reviews (AORs) in Texas"

TYPE OF REPORT: Quarterly Technical Report - 10th Quarter

REPORT START DATE: January 1, 1997

REPORT END DATE: March 31, 1997

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REPORT ISSUE DATE: April 15, 1997

DOE AWARD NUMBER: DE-FG22-95MT95007

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ABSTRACT

The following technical report provides a detailed status report of the DOE grant project entitled "Develop Data Management System for Assistance in Conducting Area of Reviews (AORs) in Texas." The grant funding allocated is for the purpose of providing the Railroad Commission of Texas (Commission or RRC) with resources and capabilities to conduct AOR and AOR variance analysis statewide.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The following technical report provides details on tasks that have been completed, tasks that are currently in progress, and tasks that are scheduled to begin in the next quarter (11^{th}). This report is for the tenth (10^{th}) quarter, from January 1, 1997 through March 31, 1997.

The Commission has made substantial headway on all components of the project. Build-out of the GIS infrastructure is virtually complete, and the development of GIS data layers is entering its final stages. The Client/Server infrastructure is partially in place. Server capacity requirements are being modeled and validated as database tables are created, with the majority of database table creation now completed. Final database modeling is also mostly completed. Document imaging and workflow components are under evaluation. Local area network implementations in district offices are slightly behind schedule; however, work will be accelerated during the next (11^{th}) quarter to bring this task back on schedule. Additional wide area network implementations are being moved to the 11^{th} and 12^{th} quarters due to a transition underway in the operations of the current telecommunications provider.

INTRODUCTION

The Commission's application for grant funds for this project was approved by DOE on February 14, 1995. Funding for this project has been awarded in five (5) increments over the project period. The initial award notification was received on February 10, 1995 for $550,000. Subsequent award notifications were received on May 7, 1996 for $275,000; July 23, 1996 for $75,000; October 28, 1996 for $236,157; and December 18, 1996 for $100,000.

Funding for this project was for a two-year period. The Commission requested, on December 23, 1996, a no-cost extension of the project period. The Department of Energy approved this extension, through Amendment No. 009, on January 16, 1997. The extension changed the completion date from February 13, 1997 to October 31, 1997. This extension will allow the Commission to fully utilize allocated funds in the most cost-effective manner.

The objectives are to provide resources and capabilities to enable the Commission to conduct Area of Review (AOR) variance analysis on a statewide level, including: 1) the identification and analysis of areas that may qualify for AOR variances; 2) the correlation of information from various databases and automation systems to conduct AORs in areas that do not qualify for variances; 3) the evaluation of the risk of pollution, during permitting and monitoring, using risk- based data analysis; and 4) the ability to conduct spatial analysis of injection well data in conjunction with other geographically referenced information. The Commission will achieve these objectives through the acquisition and implementation of the following components: 1) a Geographic Information System (GIS); 2) a Client-Server/Scanning System; and, 3) a Local Area Network/Wide-Area Network (LAN/WAN) system encompassing the district offices.

RESULTS AND DISCUSSION

The Commission has made significant progress with development of GIS data layers needed for the AOR application process. The hydrography layer is complete as are most of the base map reference layers. Development of the Original Texas Land Survey data layer, which represents the largest part of the GIS conversion process, has begun and is proceeding steadily. The conversion of the survey and oil and gas well data for high priority AOR counties will be completed by the end of September. High priority counties are those counties with the greatest numbers of injection wells. A prototype AOR application will be developed next quarter (11th Quarter) which will demonstrate the majority of the AOR process requirements.

The Client/Server portion of the grant project centers around the development and population of the oil and gas databases needed to process the AOR applications and analyze AOR variance criteria. This work is made up of database modeling and table creation, which is ongoing. Significant portions of the database tables have been migrated from the mainframe environment, including the Oil and Gas Field, Operator, Lease, and County and District tables. Work is continuing on the Wellbore tables, and work will begin next quarter (11th Quarter) to convert the Underground Injection Control (UIC) data tables along with other small environmentally related data tables.

Since February, the provider of wide-area network telecommunications services for the state has undergone a transition which generated significant concern for the Commission. The provider's staff and equipment was transferred to another agency, causing considerable changes in policies, procedures and increased costs. The Commission is evaluating alternative service providers to meet wide area networking needs, and will accelerate WAN installations between June and August to compensate for slippage in the last quarter.

The following information details the status of each of the above-referenced project components. **Included are the following: 1) what tasks have been completed as of the end of this reporting period (10th Quarter); 2) what tasks are still in progress as of the end of the 10th Quarter; and, 3) what tasks are planned to begin during the next quarter (11th)**.

GEOGRAPHIC INFORMATION SYSTEMS (GIS) COMPONENT		
Status	**Task**	**Percentage Completed**
Completed	Acquire GIS software (for development and data conversion)	Completed
	Stabilize INFORMAP environment (migrate users from old VAX8800 to VAXstation cluster)	Completed
	Provide GIS technical training for developers and production staff	Completed
	Perform GIS database design	Completed
	Convert GIS data	Completed
	Acquire GIS development tools	Completed
	Acquire additional GIS workstations for GIS migration	Completed
	Develop GIS hydrography data layer	Completed
	Develop 5 GIS reference layers including airports, cemeteries, govt. lands, subdivisions, and quad grid	Completed
Still in Progress	Develop GIS political boundary data layer	90%
	Develop GIS transportation data layer	75%
	Develop GIS annotation map layers	25%
	Develop land survey conversion procedures	90%
	Conduct quality control/quality assurance	50%
	GIS technical training	75%
	AOR application design	25%
	GIS workstation upgrade	50%
To Begin Next (11th) Quarter	Develop GIS oil and gas well data layer	0%
	AOR application development	0%
	Convert land survey data	0%
CLIENT SERVER/SCANNER COMPONENT		
Completed	Acquire hardware for Client/Server developers	Completed
	Acquire development tools for Client/Server developers	Completed
	Acquire connectivity software for Client/Server developers	Completed
	Acquire development server	Completed
	Provide development tool training for developers	Completed
	Evaluate and select relational database	Completed
	Perform additional development tools evaluation	Completed
	Provide additional connectivity from Client/Server to mainframe	Completed
	Evaluate database design tools	Completed
	Provide additional connectivity from server to PCs for developers	Completed
	Create operator database tables for AOR	Completed
	Create lease database tables for AOR	Completed
	Create county/districts database tables for AOR	Completed
	Create field database tables for AOR	Completed
Still in Progress as of 10th Quarter	Perform database modeling for table creation	80%
	Create database tables for AOR (wellbore)	85%
	Extract and load mainframe data into Oracle	60%
	Evaluate database server requirements	25%
	Develop scanning requirements and evaluate vendor software/hardware	50%
To Begin Next (11th) Quarter	Acquire additional database development tools	0%
	Expand database server capacity for full database load	0%
	Select document imaging/scanning system	0%

	Select additional application development tools	0%
Status	**Task**	**Percentage Completed**
	Create database tables for AOR (UIC, other environmental data)	0%
	Provide application technical training for developers	0%
LOCAL AREA NETWORK/WIDE AREA NETWORK (LAN/WAN) COMPONENT		
Completed	Develop LAN/WAN implementation plan	Completed
	Acquire hardware and software for Houston district office	Completed
	Install LAN/WAN equipment at Houston district office	Completed
	Train Houston district office staff	Completed
	Provide post-implementation support for Houston district office	Completed
	Acquire hardware and software for Midland district office	Completed
	Install LAN/WAN equipment at Midland district office	Completed
	Train Midland district office staff	Completed
	Provide post-implementation support for Midland district office	Completed
	Evaluate and purchase upgraded mainframe connectivity options	Completed
	Place Kilgore equipment orders	Completed
	Prepare Kilgore equipment	Completed
	Install Kilgore district office LAN	Completed
	Train Kilgore district office staff	Completed
	Develop equipment list for Wichita Falls district office	Completed
	Order equipment for Wichita Falls district office	Completed
	Review detailed plan of WAN portion of Kilgore district office upgrade	Completed
Still in Progress as of 10th Quarter	Negotiate WAN contracts	50%
	Plan for Wichita Falls district office upgrade	30%
	Provide post-implementation support for Kilgore district office	50%
To Begin Next (11th) Quarter	Install LAN in Wichita Falls district office	0%
	Train Wichita Falls district office staff	0%
	Provide post-implementation support for Wichita Falls district office	0%
	Plan and implement LAN installation in San Antonio district office	0%
	Plan and implement LAN installation in Corpus Christi district office	0%
	Plan and implement LAN installation in Pampa district office	0%
	Award WAN contracts	0%

CONCLUSION

In conclusion, the Railroad Commission is nearing completion of the GIS component. Work still continues on technical training, application design and development, and workstation upgrades. Beginning in the next quarter (11th), development of the GIS oil and gas well data layer will begin. Database development is still in progress on the Client/Server component with database modeling and evaluation and acquisition of database tools continuing. Beginning in the next quarter (11th), selection of the document imaging/scanning system will begin and additional database development tools will be selected. On the LAN/WAN component of the project, coordination of the WAN portion of the Kilgore district office upgrade is continuing. Additionally, installation of the LAN/WAN in the Wichita Falls district office is also in progress. Beginning in the next quarter (11th), implementation of the LAN portions of the LAN/WAN installation in the San Antonio, Corpus Christi, and Pampa district offices will begin.

LIST OF ACRONYMS AND ABBREVIATIONS

RRC	-	Railroad Commission of Texas
Commission	-	Railroad Commission of Texas
AOR	-	Area of Review
DOE	-	Department of Energy
GIS	-	Geographic Information System
LAN/WAN	-	Local Area Netork/Wide Area Network
C/S	-	Client Server